June 17, 1961

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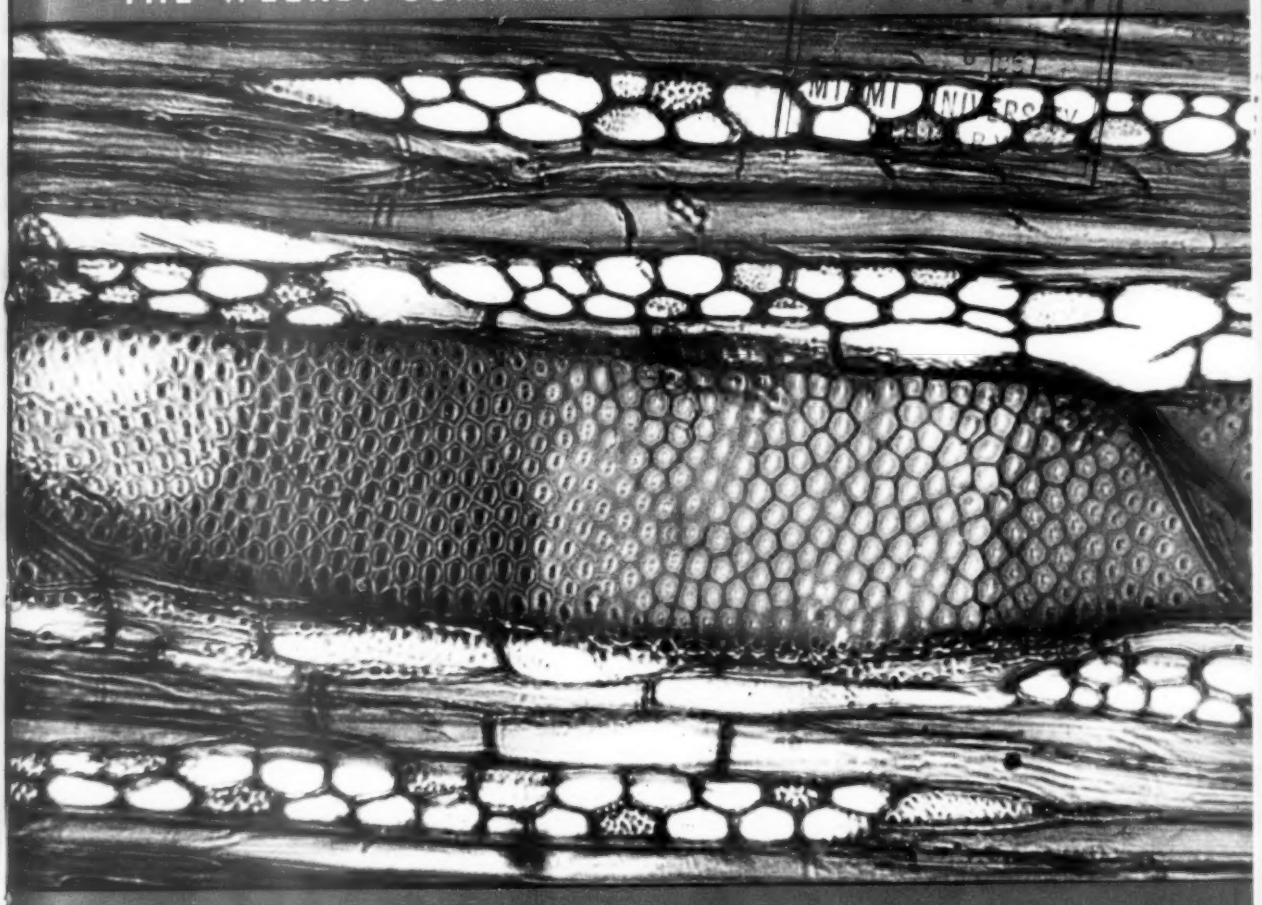
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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MEDICINE

Apply Medical Research

➤ RESEARCH discoveries save mice, not men, until they are applied, Secretary of Health, Education and Welfare Abraham Ribicoff said in a recent address.

"Breakthroughs in research," he told graduates of the University of California Medical School, "should not be followed by breakdowns" in applications to people.

Some of the United States failures or slowdowns in medicine, Sec. Ribicoff charged, are:

"The U. S. has slipped to tenth place among the nations of the world in prevention of infant mortality.

"In this seventh year of the dramatically effective Salk vaccine, nearly 80,000,000 people under 40 still have not completed the recommended course of injections.

"Every year nearly 13,000 women die of cervical cancer, a disease which can almost infallibly be detected by a simple test in its curable stages.

"Twenty thousand American lives are taken each year by rheumatic fever and rheumatic heart disease—diseases caused by a chain reaction, which, I understand, can be broken at the beginning and in the middle. The list could be multiplied indefinitely."

Sec. Ribicoff called on the young medics to join in developing programs for "exchange of skilled medical people between our nation and others," as well as providing for this country's health.

Sec. Ribicoff put in a plea for the needs of old people, indirectly touching on the Administration's proposed social security medical program for the aged, bitterly opposed by the medical profession.

"Let us face the fact that often—most frequently among our older people—they do not get it (medical service) because they cannot pay for it. . . . Too proud to impose on their children or on others, too ashamed to seek public alms, they postpone the day of reckoning until the point of no return," Sec. Ribicoff said.

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NEUROLOGY

Brain Probe Computers

➤ MORE HIGHLY TRAINED young scientists are needed to exploit the potentialities of electronic computers in the study of human brains, Dr. Walter A. Rosenblith of Massachusetts Institute of Technology reported.

The modern computing machine, he told a National Science Foundation meeting in Washington, D. C., is "the most general and flexible technological tool that man has produced." Hence, it appears to be a natural tool for the study of brain functions.

Much of the computing equipment now available, however, was designed for calculations of a routine nature, such as one encounters in a business office. In neurophysiological research there is little need yet for such routine calculations, so present-day computers may have to be modified, or operated in different ways, to be employed effectively in this field.

Dr. Rosenblith envisions a relationship between a scientist and a computer similar to that between a scientist and a microscope. To attain such a flexible, direct relationship, the gaps between computer technology and biological science must be bridged. To some extent, he thinks, this can be done by team research, but the long-range goal should be to give young scientists the requisite combination of skills. Research centers in which such young men can be trained are needed now, he said.

"Just as the brain is studied in laboratories of different size and type, computer installations can be expected to vary in kind, capacity and organizational structure," in Prof. Rosenblith's opinion.

"During the next few years we shall see a multiplication of big computer installations in this country; however, few if any of these multi-million-dollar computation centers can be expected to be conceived in response to the particular needs of brain researchers. Hence, this group will either need to find a way to share in the use, and perhaps even the management, of these giant installations or to develop smaller computation facilities that are peculiarly attuned to its special requirements."

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MEDICINE

Tool for Cancer Research

➤ SYNTHETIC PRODUCTION of a chemical compound, closely resembling a natural chemical found in most human cancer cells, provides an important new tool for cancer researchers, the Veterans Administration has reported.

Tests have shown that the synthetic apparently is identical to Cytolipin H, which occurs naturally in cancer cells in high concentration. But more data are needed to determine if it is actually an isomer of Cytolipin H—that is, if it has the same number of atoms but a differently arranged atomic pattern.

Dr. Alfred C. Schram, VA biochemist who synthesized the chemical in experiments at the Dallas Veterans Administration Hospital, said Cytolipin H has some association with producing antibodies—cancer-fighting substances in the blood. He believes the synthetic will speed development of possible vaccines, and may offer research possibilities as a therapeutic agent.

Laboratory production of the compound, Dr. Schram said, "is important because it offers a new approach to learning what makes a cancer cell a cancer cell, and perhaps to explain why cancers kill people."

Producing a small amount takes a full month and is expensive, with one of the starting materials costing $200 a gram. Largest amount recovered in crystal form in a single operation to date was one and one-half milligrams. But use of an infrared spectrophotometer at the Dallas hospital permitted complete analysis using only five-millionths of a gram, Dr. Schram reported.

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MEDICINE

Screening of Children Detects Heart Disease

➤ HEART DISEASE in children will no longer go undetected if a mass screening method is adopted in the United States.

The Chicago Heart Association reported that a cooperative study showed the test, which covered about 15 months, proved 91% accurate.

The method, which was tried on 33,026 Chicago public elementary school children, consists of recording children's heart sounds on hi-fidelity tapes that are later read by especially trained cardiologists. A mobile trailer containing the especially constructed equipment traveled to 39 schools where student heartbeats were recorded.

Abnormalities were found in two children per thousand screened, a total of 64 children, of whom 32 had previously undetected heart ailments.

An average of 250 children could be screened in one day. The nurse-technician put a stethoscope-like microphone to the child's chest and in 25 seconds the pupil's heart sounds were recorded for later interpretation.

Agencies cooperating with the Chicago Heart Association were the Chicago Board of Health, the Chicago Board of Education and the Chicago Medical Society.

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IMMUNOLOGY

Spring-Driven Instrument For Tuberculin Test

➤ A SPRING-DRIVEN instrument that can release tuberculin in a hardened gelatin pellet between layers of the skin is being tested in an effort to replace the hypodermic needle now in use for TB tests.

Dr. Floyd M. Feldmann, director of research for the National Tuberculosis Association, designed the projector and the Armour Research Foundation perfected the technique of the procedure.

The next problem is to test thoroughly the properties of the pellet, that is, to make certain that the binder does not in any way influence the reaction to the tuberculin.

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PSYCHIATRY

Hope for Criminals

Hope for improvement of criminals who are mentally abnormal was seen at the Third World Congress of Psychiatry, Marjorie Van de Water reports from Montreal, Canada.

➤ HOPE FOR IMPROVEMENT or even final cure for serious criminals who are not psychotic but are mentally abnormal was raised at the Third World Congress of Psychiatry, Montreal, Canada.

Dr. Manfred S. Guttmacher, psychiatrist of Baltimore, raised this hope by reporting on his personal contact with three widely separated institutions for the treatment of psychopathic offenders. Psychopaths have been called "persons born without a conscience." They are considered by prison authorities to be among the most serious problem members of prison populations, and the group least responsive to ordinary penal measures.

The three institutions described by Dr. Guttmacher—located in Denmark, Holland and near Baltimore in the U. S.—are operated like hospitals, not like prisons, although there are walls, locks, bars and guards. Discipline is strict but molded and limited by therapeutic goals.

Orders are accompanied by explanations. Infractions are not overlooked, but an attempt is made to understand the reason for them. A vengeful attitude is almost entirely absent. Both individual and group therapy is used in every case. Each of the institutions is headed by an experienced psychiatrist.

Although psychopaths are noted for the chronic nature of their criminal acts, this sort of treatment has reduced recidivism (a falling back into prior criminal habits) among the men treated. Comparison of the rate of recidivism among men living in the institution in Denmark with that of a neighboring penitentiary showed significantly fewer repeat crimes among the psychopaths than among the "normal" criminals.

This was true of all three groups of offenders — those involved in property crimes, crimes of violence and sex crimes.

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English, Russian Patients

➤ IN THE NEXT 50 years, England will cut in half the number of mental patients now in hospitals—a drop of some 70,000 hospital beds.

This hopeful outlook was reported to the Third World Congress of Psychiatry, Montreal, Canada, by Dr. Walter S. Maclay of London. At present, he reported, 75% of all new admissions to mental hospitals are discharged within three months and more than 90% are discharged or die within two years.

With new methods of treatment in open hospitals, virtually all restraints and restrictions used in the past are now unnecessary. Deteriorated, hostile, aggressive, suicidal, dirty, frightened, distraught patients have disappeared, and those patients who are compelled to remain in the hospital are not resentful, nor are their relatives.

New methods credited with these dramatic changes include physical treatment, such as electric shock therapy and brain surgery, and drugs, such as tranquilizers or psychic energizers that can calm the agitated and stimulate the depressed or apathetic, as well as psychological methods for individual and group treatment.

Modern methods are making a maximum of psychiatric aid available to the people of the USSR, Dr. E. A. Babayan of Moscow reported to the meeting.

Among the variety of facilities now available are traveling psychiatric units and teams, psychiatric counseling offices in factories and schools, psychiatric help to outpatients at dispensaries, and psychiatric wings in general hospitals.

Mental hygiene is now a branch of public health in Russia.

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MUSEUM RADIOS—Two English schoolboys get the facts on a model power station through 7-ounce transistorized radio receivers at the Science Museum in London. The recorded talk lasts about 20 minutes and guides listeners from one exhibit to the next.

MEDICINE

Iron Drugs Eliminate Surgery for Bleeding

➤ SURGERY to correct abnormal menstrual bleeding and chronic bleeding from the stomach and intestines is eliminated in some cases by treatment with new iron drugs.

Because loss of blood results in iron deficiency anemia, iron has been used for many years in the treatment of patients with such abnormal bleeding. But because of unpleasant side effects in many instances, treatment was most commonly discontinued after the anemia had been moderately corrected.

In recent years new iron drugs have been developed that do not produce these side effects, so iron could be administered over longer periods of time and in larger doses. With the more liberal use of iron in the treatment of this kind of anemia, it was unexpectedly noted that abnormal bleeding often stopped.

This prompted further investigation of the problem by Dr. Arthur J. Samuels of the University of California, Los Angeles, Medical School.

In 13 of 15 patients studied by Dr. Samuels, bleeding ceased following adequate replacement of tissue iron stores. These included all eight patients with abnormal menstrual blood loss and five of seven with bleeding from the stomach and intestines.

It is not known why the iron treatment seems to stop the bleeding. One theory is that iron deficiency may be associated with abnormal function of tiny blood vessels that normally function as a first line of defense against a tendency to bleed. Thus iron repletion may help to correct the problem.

Another suggestion has to do with possible coagulation effects of iron at the local site of bleeding.

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GENERAL SCIENCE

NSF Stresses Research

➤ THE NATIONAL Science Foundation is asking Congress for a $275,000,000 appropriation for fiscal 1962—an increase of more than $99,000,000 over funds made available during the current fiscal year.

Largest share of the increase, if granted, would be allocated to Foundation programs for support of basic scientific research, largely at colleges and universities. A total of $175,900,000 is proposed for such programs, increasing this year's available amount by $75,915,000.

In a statement presented to justify the estimate at hearings before a subcommittee of the House Committee on Appropriations, the Foundation pointed to the reported need for 1,200,000 new scientists and engineers by 1970, plus an additional 400,000 to replace losses in the present work force.

"Educational institutions must be strengthened to meet their responsibilities for the advancement of science," the Foundation emphasized.

Immediate needs cited in addition to more basic research include new facilities and equipment, self-improvement courses for faculty members, updated course content and materials, expanded programs to support students with high ability, improved science teaching at the high school level, and improved programs for disseminating science information.

The $89,300,000 total for individual grants and contracts in basic research would enable the Foundation to support about 36% of an estimated $248,000,000 in research proposals expected to be received in fiscal 1962. Support would be provided on a 60% (of dollar value) basis for continuing research projects, and 18% for beginning projects.

Other phases of the program involve $30,000,000 for improvement of graduate research laboratories at universities and other institutions; $8,500,000 to complete building and equipment of two vessels for oceanographic research; $10,500,000 for major research programs involving both Government agencies and non-Government institutions; and $8,000,000 for the Foundation's information programs.

In the Foundation's education programs, $20,000,000 is sought for scholastic fellowships; $38,000,000 for special institutes for science and mathematics teachers; $10,000,000 for course subject-matter content improvement; $12,000,000 for aid to outstanding college undergraduates; and $4,500,000 for aid to outstanding high school students.

"Delay (in accelerating the overall program) will only increase the ultimate cost both in terms of money and of lost talents," the Foundation warned.

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GENERAL SCIENCE

Edison in Hall of Fame

➤ THOMAS ALVA EDISON was the 25th scientist or inventor honored by having his bust placed among the busts of "Great Americans" in New York University's Hall of Fame, June 4.

The illustrious of America attain this bid for immortality in this manner: An electoral college is set up consisting of 120 Americans selected by the director of the Hall of Fame, now Dr. Ralph W. Sockman, and ratified by the senate of New York University. The electoral college meets every five years to select new additions to the Hall of Fame for that half decade. In addition to the new nominations, all those who received 20 or more votes in the election five years previously are considered.

The Hall of Fame was endowed by Mrs. Helen Gould Shepard. The first year elections were made to the Hall was 1900. In that year 29 Americans were honored in the Hall and of these seven were scientists or inventors. They were:

John James Audubon, ornithologist and renowned painter of birds, 1785-1851. Benjamin Franklin, 1706-1790, famous for his pioneer experiments on electricity, and great statesman and philosopher; Robert Fulton, 1765-1815, inventor who gave us the steamboat; Asa Gray, 1810-1888, botanist; Thomas Jefferson, scientist-farmer-President, 1743-1826; Samuel Finley Breese Morse, 1791-1872, inventor who developed the telegraph, and Eli Whitney, 1765-1825, inventor of the cotton gin.

Of the eight elected to the Hall of Fame in 1905, only one scientist was included. That was the great woman astronomer, Maria Mitchell, 1818-1889.

In 1910 ten new busts were placed in the Hall of Fame, but no scientists were represented among them. In 1915, more recognition was given to scientists and inventors. Of the nine placed there, three were scientists or inventors: Louis Agassiz, 1807-1873, Swiss-born American naturalist; Joseph Henry, 1797-1878, physicist and first secretary of the Smithsonian Institution; and Elias Howe, 1819-1867, inventor of the sewing machine.

In the 1920's, 11 busts were added to the collection but no scientists were included.

In the 1930's only seven new busts were placed in the collection but these included Matthew Fontaine Maury, 1806-1873, oceanographer, and Simon Newcomb, 1835-1909, astronomer.

The next decade saw the admission of five new busts, including that of Walter Reed, Army surgeon who determined that the *Aedes aegypti* mosquito is the only carrier of yellow fever. The 1950's saw the admission of nine new busts and of these six were scientists or inventors: Alexander Graham Bell, to whom we owe the telephone; Josiah Willard Gibbs, mathematician and physicist; William Crawford Gorgas, who, acting on the discovery of Walter Reed, wiped out the mosquito carrier of yellow fever and so eliminated that dread disease in Cuba and other important parts of the world; Theodore Roosevelt, President, who was also naturalist and conservationist; George Westinghouse, inventor; and Wilbur Wright, pioneer in aviation.

In 1960, three new names were voted to the Hall of Fame. Beside Edison, Henry D. Thoreau, 1817-1862, naturalist and writer, and Edward A. MacDowell were enshrined.

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SPACE

Planned for Space Risks

➤ THE HAZARDS of the first United States space trip gave U. S. Navy Cmdr. Alan B. Shepard Jr. some apprehensions that he met by considering how each difficulty could be licked if it occurred.

This was revealed in a pre-flight psychiatric interview with the astronaut, the National Aeronautics and Space Administration reported at a Conference on Medical Results of the First U. S. Manned Sub-orbital Space Flight in Washington, D. C.

The astronaut looked at his flight as a difficult task. Although he was confident, he could not be sure of success. However, he was more concerned about performing well than about external dangers.

The medical data from the first U. S. space flight show that Cmdr. Shepard lost exactly three pounds from a few hours before the trip until three hours after the rescue. However, only minor changes were observed in body functions before and after the space trip.

During the flight itself, Cmdr. Shepard's pulse increased. At lift-off signal it was 126 and climbed during the launch to 138. During the weightless part of the flight the pulse rate decreased to 108 beats a minute. The highest pulse rate during re-entry was 132.

The respiration rate of the astronaut was between 15 and 20 breaths per minute during countdown. A peak rate of 40 occurred during the launch period, declined to 20 near the end of the weightless flight phase and rose to 30 during re-entry. On descent it fluctuated between 20 and 25 breaths per minute.

The astronaut reported no difficulties during the flight but at the time of maximum aerodynamic pressures, at Mach number 1.0, vibration was so severe the pilot stated he had some difficulty seeing for about 15 seconds.

Cmdr. Shepard reported that for future flights the vibration problem will be avoided by providing more foam rubber for the head support of the astronaut's couch. Later space capsules will also have picture windows for observation purposes.

He said the centrifuge, the procedures trainer, and testing with the Mercury spacecraft at the launching area provided the most valuable aids during the training period before the space flight. Comdr. Shepard described his flight in detail and showed the film taken aboard the rocket during the flight.

Dr. Robert B. Voas of the NASA Space Task Group reported the astronaut had carried out his tasks of checking the instruments he was assigned to do. This is indicated by the pattern his eyes follow on the film.

The Conference was co-sponsored by the National Institutes of Health and the National Academy of Sciences.

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SPACE

Moon Rocket Described

➤ THE NOVA space rocket that will carry man to the moon, as projected in President Kennedy's extraordinary Congressional message, is expected to be half as tall as the Washington Monument, or about 275 feet.

Boosters for this space vehicle will be a cluster of liquid fuel engines or a cluster of large solid propellant engines, each having a thrust of 1,500,000 pounds. The Nova will be thirty to fifty times as powerful as the Atlas booster that is scheduled to carry man into orbit around the earth at the end of this year.

The Nova will consist of a three-stage rocket with the Apollo space capsule on top for the lunar landing. The Apollo can as yet only be described in general terms since it is still on the drawing boards, George M. Low, chief of the National Aeronautics and Space Administration's manned space flight program, reported.

He told the First National Conference on Peaceful Uses of Space in Tulsa, Okla., that the craft will be very compact in order to make it as light as possible and help ease its return into the atmosphere when the moon travelers return to earth.

It is also certain at this time that the capsule will be made up of various "building blocks," or modules, each of which is used for a certain part of the flight.

The first of these building blocks is the "command center module" that will house the crew of three during launch and re-entry. It will also serve as a flight control center for the rest of the trip.

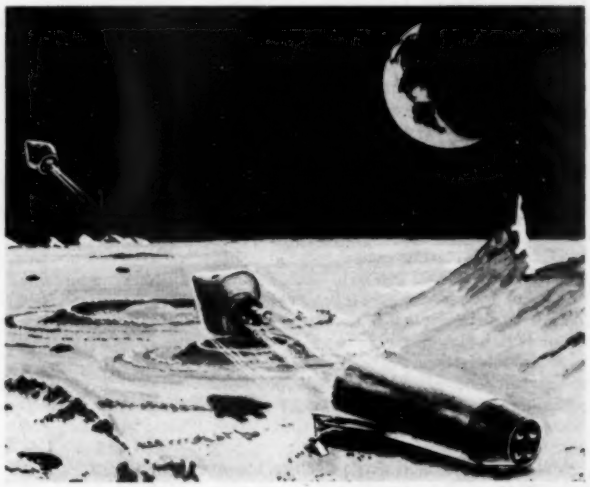
The second module is a propulsion unit that will be used as a take-off stage from the moon. This unit will also be used on earlier flights of the Apollo capsule, namely in earth-orbital flights, possibly by 1965, and in a trip around the moon without landing between 1967 and 1969.

In orbital flights this unit will be used for emergency conditions and for maneuvering in orbit. For the circumlunar trip the propulsion unit will return the space craft to earth from any point of the planned route.

For the trip around the moon, this versatile propulsion unit will provide mid-course guidance corrections. It can also place the capsule in orbit around the moon and send the capsule out of orbit and return it toward earth.

The third building block of the Apollo is a propulsion stage that will slow down the space craft as it approaches the moon and set it "gently" down on the surface. A horizontal landing on the moon is now

Lunar Landing



Lunar Take-off

pictured, but vertical landings are also possible.

An additional part of the capsule is a laboratory for earth-orbiting trips. However, of all the Apollo modules, only the command center can re-enter the earth's atmosphere and be recovered.

The actual landing on the moon will be made at a site surveyed earlier by an unmanned spacecraft. This is necessary in order to learn if there are any obstacles in the landing area and to get information about the landing surface. A moon-landing gear cannot be designed before the composition and hardness of the lunar landing surface is known.

The take-off from the moon after landing will be a difficult operation done by only three men, in contrast to the hundreds of experts on the launching pad on earth. All the equipment for take-off must be prepared, erected and checked out.

The propulsion system for the lunar take-off must be the most reliable part of the Apollo capsule. The time of take-off must be precisely planned and the guidance equipment must work perfectly for starting the capsule on the right path for its return to earth.

On trips to the moon the most serious radiation problem that threatens man will be from solar flares. Some giant solar flares send out particles of such energy and intensity that shielding against them would weigh too much to be practical.

Fortunately, flares may possibly be predicted several days in advance and flights avoided when they occur. In the past ten years, only seven giant flares were observed. Many answers about the radiation problems are still lacking, but much of this information is anticipated from scientific satellites and space probes.

During the flight to the moon, the space pilot will help maneuver the capsule.

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PHYSICS

Atom Blasts for Research

➤ IF THE NUCLEAR test ban talks now stalled at Geneva fail completely, United States scientists are brimful of ideas for purely scientific research using nuclear explosions.

They see the nuclear blasts as "uniquely necessary" for many experiments in basic research. The decision concerning whether their proposals will be accepted depends on a "difficult mixture" of scientific, economic and political arguments.

One of the suggested experiments for nuclear blasts would be the creation of elements heavier than 103, the heaviest man-made element now known. Element 106, for instance, might last for many years, compared to the fleeting part of a second that element 103 exists.

The "Scientific Applications of Nuclear Explosions," or SANE, is more limited than Project Plowshare, the Atomic Energy Commission's project concerning all peaceful uses of nuclear explosions, particularly those of economic importance such as excavating harbors or moving mountains.

Nuclear explosions are of interest to the research scientist chiefly as uniquely intense sources of neutrons (electrically neutral particles of matter, one of the building blocks of the universe), neutrinos (elusive atomic "ghost" particles that interact very rarely with matter), plasmas (gas clouds), high temperatures, gamma rays, X-rays, light, shock and radioactive isotopes. The explosions also have the capacity to transform large quantities of elements through neutron reactions.

Radioactive contamination could be kept at a very low level by conducting the nuclear blasts underground, Dr. George A. Cowan of the Los Alamos Scientific Laboratory, N. M., reports in Science, 133:1739, 1961. He suggests that some of the nuclear explosions now in the planning stage for purposes of improving seismic detection or in connection with Plowshare programs can also be used for purely scientific measurements.

Dr. Cowan states it should be possible to avoid charges of evading test ban agreements when conducting such explosions by making the tests open to all. This would increase "opportunities for cooperative research on an international scale."

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MILITARY SCIENCE

Gas-Germ Warfare Defense

➤ DESPITE growing public awareness and expanded military research, the United States has a long way to go before defenses against chemical and biological warfare are adequate.

Army officials made this clear in testimony before a House appropriations subcommittee considering Department of Defense budget proposals for the next fiscal year.

Maj. Gen. Marshall Stubbs, chief chemical officer, said a detection and warning system is essential for such attacks, "just as radar gives advance warning of oncoming missiles and planes."

The Army has a chemical agent detector kit, effective at short ranges, and is adding to its knowledge of toxic agents as new ones become known. But an actual chemical attack probably would be with "odorless, colorless and tasteless clouds," which must be detected at a distance before troops are reached and overpowered, Gen. Stubbs said.

Biological attack offers problems even more difficult. A single aircraft could release enough material to cover "several hundred to several thousand square miles." The organisms are odorless, tasteless and invisible to human eyes.

Fast, accurate identification of biological attacks is considered "technically impossible" by many scientists, Gen. Stubbs said. But recent laboratory devices show "considerable promise" for automatically detecting biological aerosols—suspensions of fine biological particles in air or gas. A contract for industrial development has been awarded.

Masks and protective clothing have been developed to protect the respiratory system and the skin against biological and chemical agents. Col. Dan Crozier, chief medical consultant for the Surgeon General's office, said the Army has "effective vaccines against many of the diseases which are potential biological weapons," and is making rapid progress on others.

Disease casualties, he said, may have two to ten days between exposure and illness. But lethal gas casualties in chemical warfare may have only "a matter of seconds and minutes" for treatment. He believes a vast educational program is needed to make the public aware of treatment methods.

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MILITARY SCIENCE

Long-Range System For Spotting Submarines

➤ A SONAR SYSTEM for detecting and tracking enemy submarines long before they reach United States shores is being developed by the U. S. Navy.

The system uses a roving sound transmitter, packed on a ship, earphones on the ocean floor, and relay stations spotted along the ocean waters. The sonar system is part of the Office of Naval Research's Project Artemis.

The submarines are detected when sound waves sent through the water by the transmitter bounce off the submarine. By measuring the time the waves take to travel back, the distance to the submarine can be determined. The exact range of the anti-submarine system is still undisclosed by the U. S. Navy.

The sound transmitter, or transducer, which is five stories high and weighs hundreds of tons, will be carried on a former Navy tanker, the USNS Mission Capistrano. The ship is equipped to raise and lower the transmitter into the water and also provide power for its operation.

The U. S. Navy has already built a relay tower, called Argus Island, on top of an extinct underwater volcano off the Bermuda coast. The man-made island, sticking nearly 100 feet above the ocean surface, will relay sound waves picked up by hydrophones scattered along the ocean floor.

Columbia University's Hudson Laboratories, the prime contractor of Project Artemis, is working with nearly 30 university, Governmental and industrial scientific groups in carrying out the program.

The ship is scheduled to operate in waters stretching from Cape Hatteras to Bermuda.

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PUBLIC HEALTH

High Alaska Fallout Risk

➤ FALLOUT DANGERS to humans, animals and plants from proposed nuclear explosions at Cape Thompson, on the northwest coast of Alaska, were reported as high by the Committee for Nuclear Information in St. Louis.

The committee said the public has a chance to decide in advance whether gains from Project Chariot outweigh risks. Project Chariot, part of the Plowshare program for developing peaceful uses of nuclear blasts, is designed to test large-scale nuclear excavation by digging a hole 1,500 feet in diameter and a channel 2,000 feet long to connect the hole with the sea.

John S. Kelly, chief of the Atomic Energy Commission's peaceful nuclear explosives branch, said AEC has authorized investigations, but not the actual explosions. Approval will not be given until AEC is sure local inhabitants and "the plants and animals from which they derive their living" will not be endangered, he said.

The job would require one 200,000-ton atomic bomb and four 20,000-ton bombs. The smaller bombs are the same size as the Hiroshima bomb.

Dr. Michael W. Friedlander, associate physics professor at Washington University, St. Louis, challenged a laboratory prediction that only five percent of the total radioactive yield would emerge as fallout. Wind conditions and other uncertain factors could raise it to five times that much, he said.

Caribou in the region supply the Eskimo with food. Caribou graze on lichen, a plant absorbing mineral nutrition from airborne dust rather than soil. Dr. Barry Commoner, plant physiology professor at Washington University, said fallout absorbed by lichen could harm the entire northern Alaskan "food chain" of interdependent plants, animals and humans.

He pointed out that the strontium-90 level content in the bones of Alaskans already is known to he higher than that found in inhabitants of temperate zones. Additionally, present levels of strontium-90 in caribou bones are "probably the highest found in any known food animals."

Carnivorous animals also affected include grizzly bears and wolverines, both on the "danger list" of rare mammals threatened with extinction.

• Science News Letter, 79:375 June 17, 1961

PUBLIC HEALTH

AEC Finds No Biological Reason to Stop 'Chariot'

➤ SCIENTIFIC SURVEYS "have not revealed any biological reason for stopping or deferring" Project Chariot, the proposed experimental nuclear blast in northwest Alaska, the Atomic Energy Commission declared in Washington, D. C.

But the Commission said studies will continue, and again promised the test will not be approved unless there is full assurance that plant, animal and human life will not be endangered. Final authorization must come from the President.

Chariot, a phase of AEC's Plowshare program on peaceful uses of nuclear explosives, would use five bombs to dig a man-made harbor in the Ogotoruk Creek area at Cape Thompson. Although not commercially useful, the harbor would provide information on nuclear explosions for excavation purposes.

Preliminary estimates indicate large canals could be excavated at one-third the cost, in half the time, and would be "wider, deeper, less vulnerable to destruction and otherwise better" than conventional types.

In St. Louis, the Committee for Nuclear Information cited fallout dangers from Chariot as a potential threat to the entire northern Alaskan "food chain" of interdependent plants, animals and humans.

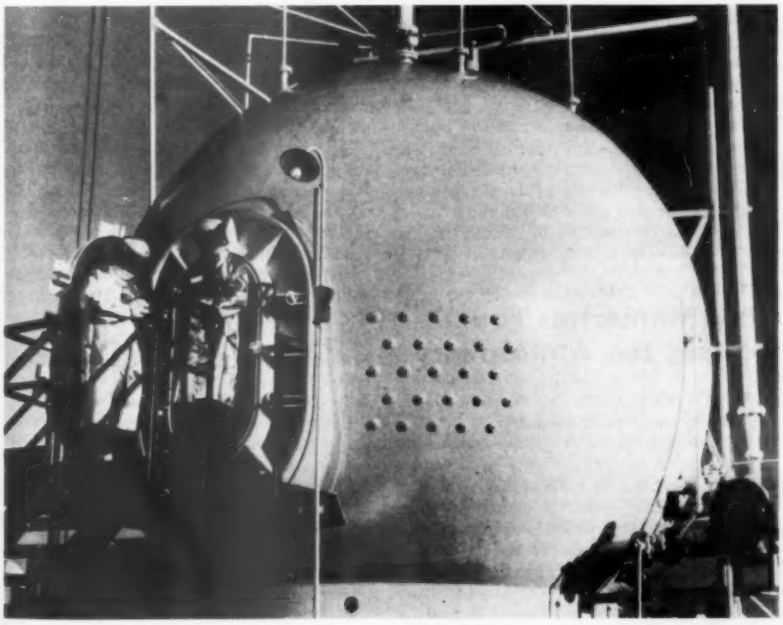
But the more than 30 surveys made since 1959 by Chariot's Committee on Environmental Studies led to AEC predictions of "exceedingly remote" chances for major biological change in the area. No plants or animals "essential to the livelihood or culture of the Eskimo" would be wiped out or scattered, the AEC believes.

Localized effects include two that would also result if conventional excavation techniques were used—the redepositing of 30 million cubic yards of debris, and possible shore current modifications when the new basin fills with sea water.

In the immediate crater area, plant and animal populations and habitats will be totally destroyed. Radiation effects are expected to be "negligible, undetectable, or possibly nonexistent" in areas distant from the crater. But intensive pre-shot studies are still in progress.

AEC now holds a land use permit, but application is still pending for withdrawal from public domain of the 1,600 square miles involved.

• Science News Letter, 79:375 June 17, 1961



TESTING SPHERE—An 18-foot sphere simulates space conditions for testing solid rocket fuels. The testing facilities, developed by Esso Research and Engineering Company, Linden, N. J., include a laboratory from which propellants can be fired remotely.

BOTANY

Wood Shows Pattern In Microphotograph

See Front Cover

➤ INTERESTING PATTERNS are shown when thinly cut slices of wood are viewed and photographed under the microscope. The cover picture this week is of the interior of a South American species of avocado, *Persea lingue*, a tree that grows in lowland areas of the Andes in Chile. Such trees, used for wood, grow as high as 90 feet tall.

The 380X microphotograph was made at the Universidad Austral de Chile at Valdivia, a southern city of that nation that was badly damaged by a severe earthquake in May 1960. The university has been rebuilt partly with American funds and is becoming an important educational and research center under the presidency of Dr. Edwardo Morales.

Prof. Guillermo Mittak, forestry engineer of the University's Institute for Wood Utilization took the microphotograph during investigations on Chilean wood resources.

• Science News Letter, 79:375, June 17, 1961

MEDICINE

Meningitis Still Problem In Newborn Infants

➤ DESPITE MODERN drug treatment, bacterial meningitis in the newborn infant is still almost as much a problem as it was 30 years ago.

Twenty-six of 39 infants studied in Cincinnati died of this disease, three physicians report in The New England Journal of Medicine, 264:1115, 1961. Bacterial meningitis is a potentially curable disease but because it is difficult to diagnose in the first month of life, when it most often occurs, it remains dangerous.

Complications of birth increase the occurrence of bacterial meningitis. Infection may take place in the uterus or in the birth canal, the researchers report.

"In the majority of the infants with obstetric complications (68%) in this study, the disease began before the sixth day of life, and all infants born of mothers with fever or premature rupture of the membranes had the onset by the sixth day," the physicians state.

The difficulty of diagnosis is complicated by the signs present in other illnesses. In this study, six had diarrhea, which was the first sign in one. Significant respiratory distress was encountered in 13 patients and was the initial sign in six. The occurrence of pneumonia, gastroenteritis or other infection in a newborn infant increases the possibility of meningitis.

The researchers say that meningitis should be considered in all newborn infants who fail to do well or who are ill in any manner. The disease is more common in premature infants than in those born at term.

Drs. Robert V. Groover, Children's Hospital; James M. Sutherland, University of Cincinnati College of Medicine; and Benjamin H. Landing, of both Children's Hospital and the University of Cincinnati College of Medicine, report the study.

• Science News Letter, 79:376 June 17, 1961

MEDICINE

A Drop of Blood Tells Likely Heart Cases

➤ SIMPLE and inexpensive, a new test for blood fats may prove suitable as a screening procedure for people prone to heart and blood vessel disease.

It was developed and evaluated by Drs. Charles L. Heiskell and Charles M. Carpenter of the University of California, Los Angeles, Dr. Roy T. Fisk of Hyland Laboratories, and Drs. Warner Florsheim and Joseph Goodman of the Long Beach Veterans Administration Hospital.

The test detects increased blood levels of beta-lipoprotein, a fatty substance believed by many physicians to be involved in heart attacks due to coronary artery disease. This substance contains most of the blood fats, including large amounts of cholesterol.

The compound has been of much clinical interest in recent years because of the association of increased blood levels with such widely prevalent diseases as atherosclerosis (hardening of the arteries) and diabetes, as well as old age and the post-menopausal states. But because of the present complex and expensive methods used to measure levels of the substance, it has not gained widespread clinical application.

The new test, called the Immunocrit, requires only a drop of the patient's blood serum. The beta-lipoprotein is precipitated in a tiny glass tube by a drop of antiserum. The tube is placed in a small table model centrifuge and spun. This packs the beta-lipoprotein in the bottom of the tube. A low-power microscope is used to measure the amount of fat, which indicates its level in the blood.

The simplicity of the test and minimal equipment required make it practical for the physician's office. It is believed the procedure will be useful in detecting elevated blood fat levels in men over 40, in post-menopausal females, and in diabetics.

• Science News Letter, 79:376 June 17, 1961

SOCIOLOGY

Goals and Effort Needed For Health of Society

➤ A SOCIETY that depends on sedatives or stimulants to continue functioning cannot survive.

Adaptation and growth in the changing world demands effort, Dr. Rene J. Dubos of Rockefeller Institute, New York, believes.

Constant exposure to a threat or stress often calls into play or increases the effectiveness of the natural defense mechanisms that exist in any individual, Dr. Dubos said.

Goals are as necessary for the health of groups, countries and civilizations as they are for the health of individuals, he stated. The civilizations that survive and grow are those built on goals that go beyond the immediate comfort, satisfactions of animal appetites and avoidance of effort.

Anything that forces man to function against his goals becomes a cause of bodily or mental disease, the scientist said. In contrast, man can overcome even the most painful physical limitations and handicaps to the extent that he is functioning "in a manner that corresponds to fulfillment."

• Science News Letter, 79:376 June 17, 1961

ASTRONOMY

Tiny Meteorites Found Pelting the Atmosphere

➤ TINY METEORITES one-thousandth the size of micrometeorites have been detected entering the earth's atmosphere from the moon.

The microscopic meteorites, dubbed "nanometeorites," were discovered when a U-2 research plane collected air samples 60,000 feet above the Arctic wastes.

The tiny particles were recorded on sensitive film exposed to the high-altitude air, Curtis L. Hemenway and Ernest F. Fullam of the Dudley Observatory, Albany, N. Y., and Laurence Phillips of Union College, Schenectady, N. Y., report in Nature, 190:897, 1961.

• Science News Letter, 79:376 June 17, 1961

IN SCIEN

PHYSICS

New Columbia Cyclotron Measures Neutron Speed

➤ COLUMBIA UNIVERSITY scientists at the Nevis Cyclotron Laboratory, Irvington, N. Y., have successfully operated a new facility that permits the speeds of neutrons to be studied with greater accuracy than ever before.

Three weeks of preliminary experiments with the giant Columbia synchrocyclotron, a new atomic "race track" which is a 660-foot tunnel permitting time-of-flight measurements of neutrons, and a new analyzer system, confirmed that the new Atomic Energy Commission facility for studying the interactions of neutrons with matter was a success.

The equipment comprises a neutron velocity selector system that uses the 385,000,000 electron volt Nevis cyclotron to provide short, intense bursts of neutrons on a target inside the cyclotron.

The neutrons are emitted almost instantaneously with a wide range of speeds and with random directions. A tiny fraction of the neutrons is aimed at a rectangular neutron "counter" that is situated at the end of the tunnel, about 660 feet away.

• Science News Letter, 79:376 June 17, 1961

PHARMACOLOGY

Amino Acids Trace Opium To Point of Origin

➤ SCIENTISTS have found a new method for pinpointing the country, and the region within the country, from which opium is smuggled.

The technique is based on amino acid content, which varies with differing environmental conditions under which the opium poppy grows. It is a refinement of a method developed by the United Nations based on mineral content of opium, a variable based on soil composition.

Dr. A. Jabbar, now at the University of Dacca in Pakistan, and Dr. E. Brochmann-Hanssen of the University of California in San Francisco, report that amino acid content of opium depends upon temperature, light and water supply during growth.

They examined 13 samples of opium from seven different countries and found that 15 recognized amino acids and three unidentified ones were present in differing amounts and combinations. They also grew their own opium and found that certain mineral deficiencies resulted in specific changes in amino acid content.

At present, the researchers reported in the American Pharmaceutical Association's Journal of Pharmaceutical Sciences 50:406, 1961, they are studying the influence of different environmental conditions on the resulting amino acids.

• Science News Letter, 79:376 June 17, 1961

NE FIELDS

ECONOMICS

Possible Cause of Red Chinese Famine

➤ THE FAMINE in Red China could be a result of a man-made upset in the natural balance of the country.

Although the Chinese blame a series of natural disasters for the severe food shortage, Dr. Georg Borgstrom, an authority on world food problems, said at Michigan State University, East Lansing, Mich., that reports coming from China point toward a different reason. The disasters probably were aided by a somewhat misguided policy on technological advances, he believes.

To counteract floods and erosion, the Chinese claim to have built 15,000,000 dams, drilled 41,000,000 wells and moved enough dirt and sand to build 450,000,000 Panama Canals since 1952.

"If only one-tenth of this is true, it is still a fantastic figure," Dr. Borgstrom said.

He pointed out that millions of Chinese have been moved to west and northwest China, Tibet and Sinkiang, on land that had been pasture for thousands of years.

"It is likely," he said, "that the Chinese used this manpower to build dams and plow pasture. If they did, evaporation and moisture demands of new crops could have resulted in a loss of water downstream."

As evidence, Dr. Borgstrom noted a British observer's report that a major river, the Hoangho, which originates in the west as do most Chinese rivers, had dried up completely for the first time in anyone's memory.

• Science News Letter, 79:377 June 17, 1961

MEDICINE

High Blood Pressure Caused by Salt Impurity

➤ DOCTORS who advise patients to stop eating salt to keep blood pressure down, probably are doing the right thing but for the wrong reason, research indicates.

Such measures are based on the idea that the sodium ion, an electrically charged portion of the salt molecule, is the prime cause of the high blood pressure. But new evidence uncovered by Dr. Lewis K. Dahl and Martha Heine at the Brookhaven National Laboratory in Upton, N. Y., has shown that some impurity in the salt is just as likely a culprit.

High blood pressure, the investigators noted, is common among the Japanese, whose table salt comes from sea water and contains a mixture of substances picked up during processing. Impure table salt also is used by many other groups.

In experiments with rats, the scientists found that there was less high blood pressure among the animals who ate chemically pure sodium chloride than among those who ate sea salt. After 14 months of eating excessive amounts of salt, the pure-salt rats averaged a blood pressure of 150, the sea-salt rats nearly 180. Anything above 140 was considered abnormally high. Control rats, those fed normal amounts of salt, averaged 120 at 14 months.

The impurity that seems to cause higher blood pressure has not been identified, the researchers report in the Journal of Experimental Medicine, 113:1067, 1961. They suspect a metal ion, but have not yet determined which one, if any, is responsible.

• Science News Letter, 79:377 June 17, 1961

GEOPHYSICS

Magnetic Storms Formed Earth's Magnetic Field

➤ A TINY CURRENT in the earth's core that was indirectly created by magnetic storms high above the earth is responsible for the earth's magnetic field today, an Indian scientist believes.

World-wide magnetic storms occurring throughout geologic history have continually built up the earth's magnetic field by sending currents deep into the earth's interior, Dr. J. S. Chatterjee, Jadavpur University, Calcutta, reports in the Journal of Geophysical Research, 66:1535, 1961. These currents, or streams of electrons, eventually reach the core where they feed the existing magnetic field.

Although the currents last or "decay" for a million years, new storms continually replenished the field until it reached the strength of the present magnetic field, the scientist said.

• Science News Letter, 79:377 June 17, 1961

MEDICINE

New Cancer Technique Brings Some Success

➤ A NEW TECHNIQUE called regional perfusion has been successful in treating some cancers that have spread, the American Association of Plastic Surgeons meeting in New York was told.

A pump-oxygenator pours cancer-killing chemicals into arms and legs that have been shut off by a tourniquet. The technique has been most widely used in treating malignant melanoma, which usually starts in a mole, spreads rapidly and frequently causes death.

Drs. Oscar Creech Jr., Robert F. Ryan and Edward T. Krementz, all of the department of surgery of Tulane University Medical School, reported that they had used regional perfusion in 96 cases of malignant melanoma involving the extremities.

The surgeons said the most encouraging results have been achieved with patients whose secondary cancers were treated by both surgery and perfusion. Seventy percent of this group have been free from symptoms for six to 30 months.

For 37% of the patients treated with perfusion alone, improvement was noted on an average of 17 months. One patient has had no sign of the disease for almost four years and another for three.

• Science News Letter, 79:377 June 17, 1961

MEDICINE

Nicotinic Acid Use Remains Experimental

➤ NICOTINIC ACID, widely used for the lowering of cholesterol in cases of hypercholesteremia, remains experimental, along with every other method presently employed for reducing serum cholesterol levels.

Dr. William B. Parsons Jr., the Jackson Clinic and Foundation, Madison, Wis., reports in the Archives of Internal Medicine, published by the American Medical Association, 107:639, 1961, that the "possibility of toxic damage to the liver, occasionally with jaundice, cannot be ignored."

Although cholesterol levels were reduced in 50 patients studied, Dr. Parsons says that in addition to effects on liver function, there were changes in glucose tolerance, slight increases in serum uric acid levels and skin changes (dryness and brown pigmentation) in some during treatment with nicotinic acid.

The mechanism of action of nicotinic acid on fat metabolism is not known, but Dr. Parsons says evidence favors "alteration in synthesis of cholesterol and fatty acids together with increased oxidation of cholesterol as a dual mechanism."

In previous experiments without dietary restriction, nicotinic acid has reduced total lipids, fatty acids and triglycerides in the same way it has reduced cholesterol.

• Science News Letter, 79:377 June 17, 1961

MEDICINE

Blood Seepage Small In Most Pregnancies

➤ IN MOST human pregnancies, no more than a fraction of a teaspoonful of blood seeps through the placental barrier from unborn child to mother, research indicates. This is particularly significant when related to difficulties resulting from such blood leakage between mother and child who are Rh-incompatible.

A group of researchers in Liverpool, England, report that among 200 mothers of newborns, only 12% showed fetal blood leakage greater than one or two milliliters, a fraction of a teaspoon.

At present they are trying to determine whether this is enough to bring about dangerous antibody response on the part of an Rh negative mother carrying an Rh positive child. In one such case where 100 milliliters, according to calculations by the investigators, of fetal blood had entered the maternal circulation, the infant was born with a severe anemia (hemoglobin 73%).

If evidence of fetal bleeding can be detected soon after it occurs, it may be possible to use a combination of injections to prevent sensitization in the mother, thus making subsequent pregnancies less hazardous.

The research is reported in Nature, 190:922, 1961, by Ronald Finn, C. A. Clarke, W. T. A. Donohoe, R. B. McConnell and P. M. Sheppard of the University of Liverpool and D. Lehane of the Liverpool Regional Blood Transfusion Service.

• Science News Letter, 79:377 June 17, 1961

EDUCATION

Machines for Teaching

Teaching machines based on step-by-step education and immediate reward for correct response are being used to spur the learning process, Judy Viorst reports.

➤ AN APPLE for the teacher is being replaced by a can of oil for the teaching machine in classrooms all over the country.

Machines based on the principle of reward for correct response are teaching everything from spelling to matrix algebra. And psychologists are experimenting with very simple machines to teach retarded children and elicit responses from schizophrenics.

Drs. James G. Holland and B. Frederic Skinner, psychologists at Harvard University, have been working for a year with retarded children. They use simple teaching machines to build up pattern recognition in 12-year-old boys with I.Q.'s of 50.

Drs. Holland and Skinner have not yet formed any conclusions as to the effectiveness of teaching machines over teachers in the education of these children. But they have found that the machines keep them active and interested in the learning process for long periods of time.

Schizophrenic Children Taught

At the University of Indiana Medical School Dr. Charles Ferster uses a roomful of automatic devices to create a rewarding atmosphere for schizophrenic children. Vending machines produce candy or a sandwich with a push of a button. Another device, when pressed, starts a toy train running. Slowly the children are beginning to understand that a simple reaction on their part will immediately produce a satisfying result.

This prompt reward for the right answer is the key element in the programmed teaching method developed by Dr. Skinner, who, introduced teaching machines to education in 1954.

Having taught pigeons to play table tennis by a step-by-small-step technique and a prompt feeding of corn for every move in the right direction, he next applied these methods to human learning. The result: A programmed education system that he believes can teach many subjects in half the time required by conventional classroom procedures.

Here is how the Skinner method works: A year's mathematics course, for example, is broken down into individual items of information, carefully graduated so that there are no big jumps from point to point. Each item, printed on a "frame," ends with a question or an incomplete sentence. The student answers the question and is immediately given a reward—the knowledge that he has responded correctly.

Dr. Skinner's program aims for no more than five percent wrong responses. He is interested primarily in the "reward" aspect of the reward-and-punishment approach to teaching.

Skinner-programmed machines may vary somewhat in appearance, but basically they have the same characteristics. The machine itself is about the size of a typewriter. It has a window in which the frames appear, one by one. There is a place for the student to write his response and a lever to pull to ascertain whether he is right.

The student's answer slides under glass when the machine's answer appears, so there is no chance to change the response. Sometimes a wrong response will call forth a hint from the machine, such as the first letter of the word desired, and the student can give it another try. Then he pulls a lever, the next frame appears and the procedure is repeated.

Essential to an effective teaching machine is a well developed program. The ideal programmer should combine an expert knowledge of a subject with an understanding of teaching machine program technique. But Dr. Skinner believes that an expert in the subject matter working with a programmer can develop sound programs in most fields.

Although programmers do not prepare their programs from textbooks, books based on teaching-machine programs have been published. Doubleday's Tutor Texts use a programmed approach to teaching. But their author, psychologist Norman A. Crowder of U. S. Industries, Inc., differs in important respects with the Skinner method.

LEARNING BY MACHINE—A student using a Skinner-programmed machine is comparing his answer with a hint of the right answer, given by the machine.

Mr. Crowder teaches in larger steps than Dr. Skinner does, offering several paragraphs of information before he ends with a question. He also permits a much larger margin of error, by giving the student a choice of answers.

Dr. Skinner feels that incorrect alternatives to questions impede the learning process, but Mr. Crowder uses them to elaborate on and clarify the original information. Then he sends the student back to select the correct answer, which in turn leads him to another set of facts, a question and multiple choice answers.

Foreign Language Machines

Machines teaching foreign languages have been in use for several years. Basically, these consist of earphones and a tape recording. The student repeats words or phrases, then plays back the tape to compare his responses with the correct ones.

In the future, it is believed, language machines could function like teaching machines—pausing at each response to signal whether it is right, and immediately correcting errors. An entire language course might be programmed in small stages on the machine.

Teaching machine principles could be adapted to film for use before an entire class. This would be particularly helpful in underdeveloped countries. The American Institute for Research, Pittsburgh, Pa., is presenting such a plan to the International Cooperation Administration.

Two questions are frequently asked about teaching machines: How well do machine-taught students retain what they have learned? And—what is going to happen to the teachers?

Few studies have yet been completed on how much students retain when taught by machines. But a check on eighth-graders taking a programmed course in a Roanoke, Va., junior high school has turned up striking results.

The class completed a year of ninth-grade algebra in one semester. Then, after being away from the subject for several months, the students were given an examination. Their scores showed an average retention of more than 90% of the material.

As for the teachers: A few months ago a group of Chicago principals expressed concern that machine-taught students might become push-button unimaginative humans, able to learn and understand only one side of a question.

Other educators warned that teaching machines, by becoming a substitute for human contact, might do harm rather than good.

But advocates of programmed education

consider the machines a teaching aid—not a teacher substitute. Debate, discussion and experiment, they declare, must always remain in the teacher's domain.

The Chicago Schools Journal recently urged teachers to accept the machines. In an article called "Let's Not Say No to the Teaching Machine," it reminded teachers that many of the duties they now have to perform should rightfully be done by mechanical means.

When machines take over these tasks, said the journal, teachers will be free to bring young minds to new heights of discriminating thinking.

• Science News Letter, 79:378 June 17, 1961

GENERAL SCIENCE

Teacher Attitude Counts

➤ THE ATTITUDE of a teacher, not the subject matter he teaches, is the crucial ingredient of his influence on the development of his science-prone students, it is reported in a study of men and women who competed in the Science Talent Search almost 20 years ago.

The research scientists in the group reported that teachers who were important catalysts in their careers taught them the "probing approach" and encouraged creativity, or offered them special opportunity through extra hours in the laboratory.

Scientists engaged in industrial management received the most direct stimulation from teachers who used a "hard facts" approach to learning.

These and other findings, summarized in the recently released publication "Science Talent, Its Early Identification and Continuing Development" by Dr. Harold A. Edgerton, are based on the study of 1,550 men and women selected from the 6,656 who participated in the Science Talent Search for the Westinghouse Science Scholarships and Awards conducted by SCIENCE SERVICE in 1942 and 1943. All were high school seniors when they competed in the Search, and the sample group included both winners and non-winners of honors in the competition.

Under a grant from the National Science Foundation, the SCIENCE SERVICE study was made under the direction of Dr. Edgerton who has been associated with the Search since its inception, developing the screening procedures and selection techniques.

Some of the other findings reported include:

Those who scored highest on the science aptitude examination were most likely to achieve higher degrees in college.

Those who remained in science came, on the average, from larger high schools than those who changed direction, entering non-science fields.

The physicians in the study group ranked family influence highest among the factors that led to their choice of profession.

The college professors reported that the influence of their older brothers, or friends of their older brothers, was stronger than that of their parents.

The women who were interviewed said their schools and teachers became important as early as second, third and fourth grades.

None of those who had been selected as Science Talent Search winners had changed his early choice of science as a profession, although some changed specific areas of science as their education progressed.

New questions which Dr. Edgerton said were opened up by the survey include how many science-directed high school students actually enter their chosen fields; what becomes of those who do not; what significant influences and obstacles are encountered by women in choosing, training for and advancing in scientific careers; and what clues to degrees of creativity may be discovered in special physical, psychological or personality types, or in characteristic behavior.

• Science News Letter, 79:379 June 17, 1961

GENERAL SCIENCE

U. S. Press Science Writers

➤ APPROXIMATELY a quarter of the more than 1,500 daily and Sunday newspapers in the United States have a reporter, full or part time, who gives special attention to science, medicine and technology.

This has been revealed in a survey by SCIENCE SERVICE conducted in anticipation of a Conference on the Role of Schools of Journalism in the Professional Training of Science Writers held in Washington, D. C., June 9 and 10.

Almost half of the science writers spend half or more of their time writing science, medicine and technology. More than one-fifth of the daily newspaper science writers spend all their time on science and related fields.

Detailed questionnaires were obtained from 249 daily newspaper and press association science writers.

Most of the science writers have had some science background either in high school or college or both. About 80% had three or more high school science courses, while more than half of these writers had one or more science courses in college.

The greatest number of science writers, 57%, write in the physical sciences while 49% write in the medical sciences. Writers feel themselves competent to write in multiple fields, with about one-third covering four or more fields of science.

Almost a third, 31%, have had more than 10 years experience, but 38% have been in this field less than five years.

Those below 50 years of age represented 71.1%. Of the 249 giving information, 67 or 26.9% were members of the National Association of Science Writers.

The influence of the youth program is shown by the fact that 89 science writers, 35.8%, reported that they have been members of a science club in high school or have had a science hobby.

The SCIENCE SERVICE Conference on Training for Science Writers was supported by the National Science Foundation and brought together representatives from schools of journalism that have given particular attention to science writing curricula. It also included representative newspaper editors, science writers and scientists.

From the conference it is expected that guidance will be given on future programs to facilitate and encourage better science reporting on American newspapers.

• Science News Letter, 79:379 June 17, 1961

PHYSIOLOGY

Split Brains Learn Tasks In Half the Normal Time

➤ IF MEN, like experimental monkeys and cats, had their brains split down the middle, they could learn twice as fast as usual.

The reason: The corpus callosum, the largest connection between corresponding structures in the right and left halves of the brain, can be cut with surprisingly little disturbance of ordinary behavior. The split brain then behaves as if it were two separate brains. The right side can learn one task while the left side learns something different. The two sides can even learn tasks that contradict each other.

Monkeys with both the corpus callosum and the right-left eye connections severed, for example, have learned with one side of the brain that pushing circular-shaped buttons will release food. At the same time, the other brain half, through the eye to which it is connected, learned that pushing square buttons brought reward.

In other words, the split-brain monkey can learn two problems in the length of time it takes a normal monkey to learn one problem.

Dr. R. W. Sperry of the California Institute of Technology, Pasadena, in analyzing recent experiments, reports in Science, 133:1749, 1961, that this "raises some questions with regard to learning theory and the role in learning of attention, motivation, mental and motor set, and the like."

The advent of the split-brain animal has opened up a whole new world of experimental possibilities "just waiting to be explored."

Brain bisection is being applied to a wide variety of human problems, he states. But "evidence is still sketchy regarding the extent to which the divided hemispheres can function independently with respect to emotion."

It is conceivable that neuroses can be confined to one brain half while the other side remains normal. Such studies can provide vitally needed background information about the workings of the brain.

• Science News Letter, 79:379 June 17, 1961

• Books of the Week •

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ADVANCED STANDING—Shirley A. Radcliffe; Winslow R. Hatch, Ed.—*Off. of Educ. (GPO)*, 24 p., paper, 15¢. Discussion of principles and practices of program enabling superior high-school students to receive college credit for college-level work.

ANIMAL HUSBANDRY HERESIES—Allan Fraser—*Lockwood, C. (Philosophical Lib.)*, 200 p., $2.40. Discusses controversial theories and practices of animal breeding.

BASIC PHYSIOLOGY—Fred E. D'Amour—*Univ. of Chicago Press*, 642 p., illus., $7.95. Textbook adaptable to course of varying length and intensity, asking students to think and solve problems.

THE BIRD WATCHER'S GUIDE—Henry Hill Collins, Jr.—*Golden Press*, 125 p., illus. by Richard Harker, photographs, $3.95. Colorful handbook telling beginner about equipment, where to look for birds, how to attract, feed, band, and photograph them.

C.R.C. STANDARD MATHEMATICAL TABLES—Charles D. Hodgman, Samuel M. Selby and Robert C. Weast, Eds.—*Chem. Rubber Pub. Co.*, 12th ed., 525 p., $4. Newly revised fact source.

CALCULUS: An Introductory Approach—Ivan Niven—*Van Nostrand*, 172 p., $4.75. Aims at balance between theory and application, a brief course for high-school teachers and liberal arts students.

THE CENTRAL PURPOSE OF AMERICAN EDUCATION—Educational Policies Commission, Benjamin C. Willis, Chmn.—*NEA*, 21 p., paper, 35¢. See story p. 358, SNL, June 10, 1961.

CHECK-UPS: Safeguarding Your Health—Michael H. K. Irwin, M.D.—*Public Affairs Committee*, No. 314, 20 p., illus., paper, 25¢ direct to publisher, 22 E. 38th St., New York 16, N.Y.

THE CHEMICAL FORMULARY, Vol. XI—H. Bennett, Ed.-in-Chief—*Chemical Pub. Co.*, 416 p., $8. Collection of new, up-to-date formulae and recipes for making products in many fields of industry, from adhesives to textiles.

COMMUNICATION AMONG SOCIAL BEES—Martin Lindauer—*Harvard Univ. Press*, 143 p., illus., $4.75. Describes recent experiments which help us to understand the "language" by which bees communicate with one another.

CONCEPTS FROM TENSOR ANALYSIS AND DIFFERENTIAL GEOMETRY—Tracy Y. Thomas—*Academic*, 119 p., $5. One-semester course at graduate level for students of mathematics.

CONTROL OF NUCLEAR REACTORS AND POWER PLANTS—M. A. Schultz—*McGraw*, 2nd ed., 462 p., illus., $12.50. Revised edition has new chapters on elementary servo-mechanisms, boiling reactors and homogeneous reactors. Includes extensive bibliographies.

THE COUPLE WHO WANT A BABY—Marie Pichel Warner, M.D.—*Funk*, 244 p., $3.95. A helpful book on the subject of infertility, dispels superstition, up-to-date on difficulties related to glandular or psychosomatic causes.

CYBERNETICS: Or Control and Communication in the Animal and the Machine—Norbert Wiener—*M.I.T. Press*, 2nd ed., 212 p., $6.50. Revision considers present status of cybernetics and the new related modes of thinking which have evolved since book's first publication in 1948.

EDUCATION AND INCOME: Inequalities of Opportunity in Our Public Schools—Patricia Cayo Sexton; foreword by Kenneth B. Clark—*Viking*, 298 p., $6. Study presenting concrete evidence that our public school system, rather than facilitating social mobility, has become an instrument of social and economic class distinctions in American society.

THE ENCYCLOPEDIA OF THE BIOLOGICAL SCIENCES—Peter Gray, Ed.—*Reinhold*, 1119 p., illus., $20. Alphabetically arranged articles by experts on developmental, ecological, functional, genetic, structural and taxonomic aspects of biology, clearly presented for scientist and layman, from *Abiogenesis* to *Zoological Gardens*.

THE FORGOTTEN PENINSULA: A Naturalist in Baja California—Joseph Wood Krutch—*Sloane*, 277 p., photographs, $5. Vivid story of exploring the long, largely unknown, dry peninsula between the Pacific Ocean and the Gulf of Mexico.

THE FOURTEEN SYSTEMS OF UNITS—Wm. R. Varner—*Vantage*, 3rd rev. ed., 159 p., $3.95. Compilation of basic physical quantities and equations of the six systems in mechanics and eight in electricity, adopted by the International Committee on Weights and Measures.

HIGHER EDUCATION IN THE USSR—M. A. Prokofiev, M. G. Chilikin and S. I. Tulpanov—*Unesco Publications (N.Y.)*, 59 p., paper, $1. Soviet reports on their higher educational system with curricula for technical and humanistic studies.

HOW TO USE VARIABLE CONTRAST PAPERS—Lou Jacobs, Jr.—*Amphoto*, 120 p., photographs by author, $2.50. Practical discussion of how to get the best contrast and range of tones in printing your negatives.

THE IMPACT OF THE NEW PHYSICS—Frank Hinman—*Philosophical Lib.*, 174 p., $4.50. Physician views some of the fundamentals of inorganic and organic evolution in the light of recent findings.

LABORATORY ANIMALS: I. Guide for Shipments of Small Laboratory Animals—L. R. Christensen and others—*NAS-NRC*, 21 p., illus., paper, $1.50. A report of the Institute of Laboratory Animal Resources, concerned with alleviating the stresses encountered by experimental animals during transport by rail, air and road.

LABORATORY MANUAL FOR GENERAL MICROBIOLOGY—Jay V. Beck and others—*Burgess*, 55 p., paper, $2. Outline of experiments to accompany elementary microbiology course.

LET US BEGIN: The First 100 Days of the Kennedy Administration—Martin Agronsky and others—*Simon & Schuster*, 145 p., photographs by Magnum, Cornell Capa and others, paper, $1.95. Commentary and pictorial review of problem areas the "New Frontier" must cope with.

THE LIFE OF THE GREEN PLANT—Arthur W. Galston—*Prentice-Hall*, 116 p., illus., $2.95; paper, $1.50. Authoritative and readable treatment, emphasizing the scientific principles important to all biology.

LIVING AMPHIBIANS OF THE WORLD—Doris M. Cochran—*Doubleday*, 199 p., 220 photographs by Robert S. Simmons and others, $12.50. Colorful and informative display of salamanders, frogs, toads and their relatives; of interest to specialist and layman.

THE LOGIC OF PERSONAL KNOWLEDGE: Essays Presented to Michael Polanyi on his Seventieth Birthday, 11th March, 1961—Paul Ignotus and others—*Free Press*, 248 p., illus., $6.75. Essays cover wide range of scientist's interests, from Polanyi's contribution to the physics of metals to the probability of the existence of a self-reproducing unit.

MOBIL TRAVEL GUIDE, 4 Vols.: Northeastern States. Great Lakes Area. South Central and Southwestern States. California and Nevada—*Simon & Schuster*, 480 p., 383 p., 480 p., 335 p., maps, paper, $1 each. Lists sightseeing, lodgings and good food.

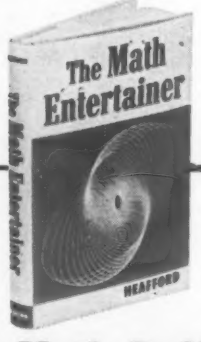
THE MORAL UN-NEUTRALITY OF SCIENCE—C. P. Snow, introd. by Warren Weaver—*Am. Friends Service Committee*, 10 p., paper, 10¢ direct to publisher, 160 North 15th St., Philadelphia 2, Pa. Reprint of address delivered before AAAS in December, 1960.

MOTIVATION AND EMOTION: A Survey of the Determinants of Human and Animal Activity—Paul Thomas Young—*Wiley*, 648 p., illus., $10.75. College text in advanced courses on motivation and the affective processes, including findings of recent laboratory experiments.

MY HOME IN THE ZOO—Gerald Iles, introd. by Fairfield Osborn—*Doubleday*, 239 p., photographs, $4.50. Zoo director's entertaining and informative tales about understanding and handling wild animals.

THE MYTH OF MENTAL ILLNESS: Foundations of a Theory of Personal Conduct—Thomas S. Szasz, M.D.—*Hoeber-Harper*, 337 p., $7.50. Psychiatrist takes a fresh look at hysteria and the whole concept of mental illness, coming to

(Continued on p. 382)



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Make Your Own Electric Motor—No better way to understand how electricity does work and the role played by magnetism. Full assembly directions of all parts—20 of them.

Cloth Without Weaving—For the future, textile-like materials that have never seen a loom. Actually, non-woven fabrics have been known for some time—felts made from fur, hair or wool. But now there are new types of such fabrics, made from vegetable and synthetic fibers. You can feel them, test them, use them and imagine clothes of tomorrow that are so cheap that they can be discarded instead of washed.

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Crystals—Can be used to help tell the composition of chemicals. You never see table salt in anything other than a cubic form. Samples of chemicals typical of crystal systems. Patterns for crystal models. 13 experiments.

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Books of the Week

(Continued from p. 380)

the controversial conclusion that psychiatrists call more and more kinds of behavior "illness."

THE NATIONAL DEFENSE STUDENT LOAN PROGRAM: A Two-Year Report—Robert C. Hall—*Off. of Educ. (GPO)*, 44 p., paper, 35¢. Summarizes and interprets information reported by colleges participating in the program.

NATURE AND MAN'S FATE—Garrett Hardin—*New Am. Lib.*, 320 p., illus., paper, 75¢. Biologist's semi-popular presentation of evolution, heredity and the future of man.

NEW CALEDONIAN LAND AND FRESH-WATER SNAILS: An Annotated Check List—Alan Solem—*Chicago Natural Hist. Mus.*, 182 p., illus., paper, $2.50. Systematic list and bibliography.

NUCLEAR PULSE SPECTROMETRY—Robert L. Chase—*McGraw*, 221 p., illus., $8.50. Discusses electronic pulse techniques applied to the study of nuclear reactions and radioactivity.

OUR FOREST BOUNTY—*Am. Forest Products Industries*, 19 p., illus., paper, single copies free upon request direct to publisher, 1816 N Street, N.W., Washington 6, D. C. Popularly told story of multiple use forest management.

PETROLEUM SOURCEBOOK 1960: A Regional Bibliography of Petroleum Information—Curtis Stevens, Ed.—*National Petroleum Bibliography*, 206 p., paper, $7.50. Worldwide geographic index to petroleum literature and data.

PHYSICAL GEOGRAPHY OF ASIATIC RUSSIA—S. P. Suslov, transl. from Russian by Noah D. Gershevsky; Joseph E. Williams, Ed.—*Freeman*, 494 p., illus., maps, $15. Translation of a textbook on the geographic regions of Siberia and Central Asia, intended for senior geography students in state universities of the USSR.

A PRELUDE TO MEDICAL HISTORY—Felix Marti-Ibanez—*MD Publications*, 253 p., $5.75. The history of medicine in short review, told in vivid narrative style. List of Nobel Prize winners, and selective medical and historical chronology.

THE PRESIDENTIAL STAFF—Joseph I. Coffey and Vincent P. Rock—*NPA*, 100 p., paper, $1.75. Analysis of the functions and organization of the staff designed to aid the President of the United States in the effective exercise of his powers.

PROBABILITY WITH STATISTICAL APPLICATIONS—Frederick Mosteller, Robert E. K. Rourke and George B. Thomas, Jr.—*Addison-Wesley*, 478 p., $6.50. Brief course in elementary probability theory, introducing student to random variables, their distributions, and properties of their distributions.

PROBLEMS IN QUANTUM MECHANICS—I. I. Gol'dman and others, transl. from Russian by D. ter Haar, Ed.—*Academic*, 394 p., $12. Collection of problems in non-relativistic quantum mechanics of varying degrees of difficulty, given to senior physics students at Moscow State University.

PROCEEDINGS OF THE 1961 HEAT TRANSFER AND FLUID MECHANICS INSTITUTE—R. C. Binder and others, Eds.—*Stanford Univ. Press*, 236 p., illus., $8. Papers presented at University of Southern California, June 19-21, 1961, reporting on completed fundamental research results.

PSYCHOTHERAPY OF THE PSYCHOSES—Arthur Burton, Ed.—*Basic Bks*, 386 p., $7.50. Fifteen leading practitioners summarize the progress to date in the treatment of the psychoses, giving samples of the wide theoretical points of view extant in current psychotherapeutic work.

QUANTUM MECHANICS—Eugen Merzbacker—*Wiley*, 544 p., $12. Textbook on elementary non-relativistic quantum mechanics for graduate students.

RADIATION CHEMISTRY OF GASES—Samuel C. Lind with Clarence J. Hochanadel and John A. Ghormley—*Reinhold*, 313 p., $12.50. Comprehensive treatment of physical principles and of gaseous reactions.

RADIOACTIVE SUBSTANCES—Marie Curie, transl. from French—*Philosophical Lib.*, 94 p., illus., $2.75. Translation of the classical thesis presented to the Faculty of Sciences in Paris by the Nobel Prize winner.

RAND McNALLY GUIDE TO MEXICO—Herman and Juanita Liebes—*Rand McNally*, 379 p., fold-out map, $4.95. Detailed handbook for planning trip through Mexico, includes fiesta calendar and suggested reading.

REFERENCE ELECTRODES: Theory and Practice—David J. G. Ives and George J. Janz, Eds.—*Academic*, 651 p., illus., $20. Encyclopedic examination of electrodes from both mechanistic and thermodynamic viewpoints, for the research worker and graduate student.

RESPIRATORY METABOLISM IN PLANTS—Harry Beevers—*Row*, 232 p., paper, $3.85. Presents biochemical events in higher plants which are of importance in respiration and considers relationships of respiration to other processes in plant. For graduate students.

SATELLITE ENVIRONMENT HANDBOOK—Francis S. Johnson, Ed.—*Stanford Univ. Press*, 155 p., illus., $5.50. Data and analyses of factors concerning structure of the upper atmosphere and of ionosphere, penetrating radiation, micrometeorites, radio noise, thermal radiation from the earth and geomagnetism.

SCIENCE INFORMATION IN LATIN AMERICA—Div. of Science Development—*Pan Am. Union*, 50 p., paper, $1. Discussion of the problems of L.A. science information organizations, and descriptions of functioning libraries and information centers.

SCIENCE, PROPHECY AND PREDICTION: Man's Effort to Foretell the Future, from Babylon to Wall Street—Richard Lewinsohn, transl. by Arnold J. Pomerans—*Harper*, 318 p., illus., $4.95. A history of man's attempts at predicting the future, from throwing dice to modern methods of predicting business cycles.

SCIENTIFIC RESEARCH AND PROGRESS IN NEWLY DEVELOPING COUNTRIES—Eugene Staley and David C. Fulton—*Stanford Research Inst.*, 48 p., paper, $3. Explores ways in which basic and applied research can be used more effectively to speed development in Africa, Asia and Latin America.

A SOCIALIST EMPIRE: The Incas of Peru—Louis Baudin, transl. from French by Katherine Woods; Arthur Goddard, Ed.—*Van Nostrand*, 442 p., $8. Scholarly analysis of the social affairs and conditions of the Inca regime in Peru, first published in French in 1928, with new foreword by Ludwig von Mises.

SOME REFLECTIONS ON GENIUS and other Essays—Russell Brain—*Lippincott*, 192 p., illus. by Norman Smith, $4.20. British neurologist discusses the physiologic make-up of the brain and nervous system of genius with comments on such men as Swift, Dr. Johnson, Lord Monboddo, and Epstein.

SPACE AND DOLLARS: An Urban University Expands—Ruth Weinstock—*Educational Facilities Labs.*, 45 p., illus., paper, free upon request direct to publisher, 477 Madison Ave., New York 22, N.Y. Explores physical expansion problems of downtown urban universities based on case study of Drexel Institute of Technology.

SPACE ASTROPHYSICS—William Liller, Ed.—*McGraw*, 272 p., illus., $10. Compilation of lectures on astronomical and astrophysical problems investigated from above the atmosphere, covering most recent advances, and many results reported here for the first time.

SPACE SHIP: The Story of the X-15—Irwin Stambler—*Putnam*, 48 p., photographs, $2.50. Tells young people the exciting story of the development of the first manned space craft and the men who test it.

SUCCESSFUL SCIENCE TEACHING—Milton S. Lesser—*Teachers Practical Press*, 64 p., paper, $1.75. Practical tips on lesson planning.

SUCCULENTS IN CULTIVATION (Cacti Included)—Vera Higgins—*St. Martins*, 168 p., illus. in color by author, photographs by J. E. Downward, $4.95. Discusses natural conditions and treatment required by more moist, less sunny conditions.

UNDER WATER & SEA ADVENTURES: The Story of the Wonderful Waters Around the Earth—Patrick Ellam—*Grosset*, 92 p., illus., $1.95. Tells young people about sea and winds, ocean bottom, marine animals and bathyscaphs.

VALUES AND IDEALS OF AMERICAN YOUTH—Eli Ginzberg, Ed., foreword by John W. Gardner—*Columbia Univ. Press*, 338 p., $6. Representative thinking on development and adaptability of the older adolescent and papers on specific problem areas.

VAN NOSTRAND ATLAS OF THE WORLD—*Van Nostrand*, 240 p., illus., paper, 98¢. Up-to-date pocket-size handbook of maps, tables and descriptive information on countries and cities of the world.

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NATIONAL GEOGRAPHIC MAGAZINES, 1888-1960, any issue. Periodical Service, Box 465-SN., Wilmington, Delaware.

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INVENTION

Patents of the Week

An effective high blood pressure drug has been patented. Other inventions include a portable magnetic recorder for diagnosing heart disease.

➤ A DRUG that effectively reduces high blood pressure stemming from many different causes has been patented.

A trio of doctors working for the Schering Corporation laboratories in Bloomfield, N. J., won patent No. 2,986,573 for a drug that lessens and helps control hypertension resulting from unknown causes and certain circulatory or vascular diseases. The doctors, who assigned the patent rights to Schering, are John G. Topliss of East Orange, Nathan Sperber of North Caldwell, and Alan A. Rubin of Bloomfield, N. J.

"Preliminary clinical work done with the new drug shows promising results," Dr. Rubin stated. "We think this is a unique drug because it appears to work directly on the arteries which are especially affected by high blood pressure." Less side effects were also observed compared to drugs commonly used today, he emphasized.

The drug with the chemical name of 2-methyl-7-chloro-1, 2, 4-benzothiadiazine-1, 1-dioxide was first tried on dogs and rats in the laboratories. Hypertensive rats were fed small drug dosages daily from four to eight weeks, appreciably reducing and maintaining the lowered blood pressure for the entire experiment.

Similar experiments on humans bore similar results. One hypertensive patient's blood pressure returned to his previous high "normal" within one week after therapy stopped.

A magnetic recorder that amplifies heart murmurs and sounds, thereby aiding doctors in diagnosing heart diseases, was another medical advance patented. Inventors Ralph H. Kruse of Pelham Manor, Howard N. Fawcett of Briarcliff Manor and James D. Digby of Croton-on-Hudson, N. Y., won patent No. 2,986,606 and assigned rights to Cambridge Instrument Co., Inc., New York.

The portable instrument can be carried to a patient's bedside or easily installed in a doctor's office. The instrument is claimed to replace the not always reliable standard stethoscope and is a convenient substitute for the more elaborate and cumbersome instruments housed at large medical institutions.

The recorder not only tapes the heart sounds but also simultaneously shows the electrocardiographic record on a screen.

Music and certain sounds, which lull a person in a dental chair, supposedly takes the patient's mind from the pain resulting from a dentist drilling. This principle is used in patent No. 2,986,140 awarded to Wallace J. Gardner, Cambridge, and Joseph C. R. Licklider of Arlington, Mass. Rights were assigned to Bolt Beranek & Newnan, Inc., Cambridge, Mass.

• Science News Letter, 79:383 June 17, 1961

VITAL STATISTICS

Earlier U. S. Marriages

➤ BRIDES AND BRIDEGROOMS in the United States are younger and closer in age at first marriage than those in any other urban-industrialized country in the world.

Half the U. S. bridegrooms in 1960 were under 22.8 years and half the brides were under 20.3 years. More men married at 21 than at any other age and more women at 18.

Men are now marrying about three years earlier and women two years earlier than at the turn of this century. The 1890 census showed that half the bridegrooms were under 26 and half the brides were under 22.

The U. S. has one of the highest marriage rates among Western industrial nations, the Population Reference Bureau in Washington, D. C., reported.

This nation's pattern of age at first marriage is closer now to the Asian pattern than to the European where bridegrooms and brides are usually about three years older than they are in this country.

Canada comes closer to the U. S. pattern than any other Western country, the median age being 24.8 for grooms and 21.7 for brides. Ireland has the oldest brides and grooms, the men averaging 31.4 years of age and the women 26.5.

In India the marriage partners are youngest, 20.0 years for grooms and 14.5 years for brides.

• Science News Letter, 79:383 June 17, 1961

Questions

MEDICINE—How many women die each year of cervical cancer? p. 370.

MILITARY SCIENCES—How many days may pass between exposure and illness in biological warfare disease casualties? p. 374.

Photographs: Cover, Guillermo Mittak; p. 371, British Information Services; p. 373 National Aeronautics and Space Administration; p. 375, Esso Research and Engineering Company; p. 378, Will Rapport; p. 384, General Electric Company.

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• Science News Letter, 79:384 June 17, 1961

HEARING AID DECOUPLER for persons using eyeglass hearing aids can remove or plug in ear connection in just two seconds. The device is supposedly ideal for individuals with mild or borderline hearing loss and who use the hearing aid only on special occasions.

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FOLDING TABLE with or without benches can be folded or unfolded in one motion. The wheeled table folds into 10½-inch width without benches, 11½-inch width with benches, for easy storage. Height-adjustable feature maintains correct elbow-to-seat dimensions for all age groups. The table comes in 6-, 8-, 10-, or 12-foot lengths.

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PANEL FLUORESCENT LAMP with square waffle pattern adds new dimension to fluorescent lighting, compressing 5-foot long arc path in a 1-foot square area. The

nearly 12-inch square panel, shown in the photograph, diffuses more light, can be used singly or in groups, and operates at 50 or 80 watts.

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FRACTIONAL DEMONSTRATION RULER for school classrooms helps teach youngsters addition, subtraction, multiplication and division of fractions. The large 48-inch by 10-inch ruler has 12 hinged tabs, each representing one inch, which can be lifted to reveal various fractions and decimal equivalents. The yellow ruler, seen clearly 30 feet away, can be hung on the wall or placed on a desk.

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DISPOSABLE PLASTIC PLATE for outdoor and everyday use indoors serves hot and wet foods without leaking. The double-thick, sectioned plastic plate has outer layer of foamed plastic resembling kidskin. Available in pastel shades of yellow, pink or blue.

• Science News Letter, 79:384 June 17, 1961

NO-STICK SAUCEPAN needs no scouring after sticky food has been cooked in it. Silicone lining baked on aluminum utensil prevents sticking. Just rinse clean with hot water after use.

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PERSONAL HELICOPTER KIT permits sportsman, tourist, farmer or rancher to build a 10-foot long, 275-pound helicopter from factory-approved plans. With top speed of 85 miles per hour and cruising speed of 65, the aircraft can fly as high as 12,000 feet. Rotor blades fold for easy storage in garage.

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Nature Ramblings

➤ THE GORGEOUS MAGNOLIAS of the South do not venture very far north, but the tulip tree, a fairly near relative, upholds the family tradition through a wide stretch of country both below and above the Mason-Dixon line. The yellow flowers, tinted with a little red and green, can be seen from Florida and Arkansas to Illinois, Michigan and Ontario.

Although the flowers are about the size and shape of tulips, the internal structure is quite different. Instead of the triple arrangements of stamens and pistil parts, they have indefinite numbers, arranged in spirals. This is the mark of relatively primitive rank in the evolutionary scale of plants.

The tulip tree, which grows to 50 or 100 feet and is the tallest of eastern forest trees, is known by various names. It is sometimes called "fiddle tree," because its peculiar leaves, with their arched bases and in-cut sides, suggest the violin shape. The gray, heavy, rough bark, similar to that of the cottonwood, has given it the name "tulip poplar" or "yellow poplar." In some areas it is called "whitewood," and its

Tulip Tree

scientific name, *Liriodendron*, is Greek for "lily tree."

Apart from the beauty of the flowers themselves and the spicy aroma of the crushed leaves and buds, the tree has other merits.

The seeds make tasty tidbits for squirrels and songbirds, and the wood has a value that was known to the Indians. It is straight-grained, soft, split-resistant, and easy to work with—just right for making dugout canoes. Even today, the wood is used for boats, as well as for furniture, toys, shingles, pulp and fuel.

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Do You Know?

Today six nations have artificial *satellite* programs whereas two years ago the United States and Russia were the sole competitors.

The idea of using machines for purposes of *teaching* originated with psychologists.

U. S. taxpayers are paying $1,400,000 each day to store *surplus* products raised on the farms.

About 200,000 *thunderstorms* occur throughout the world in a 24-hour period.

The average U. S. person ate nearly 1,500 pounds of *food* in 1960.

Transplanting the cornea of the *eye* to restore vision is more successful if the blood types of the donor and patient are matched.

Of much greater clinical significance than the measurement of *blood pressure* in the arm is the pressure at critical organs in the body, such as the heart, brain and kidneys.

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